overall survival rates revealed that there was significant difference between CRP levels less than 0.25 mg/dL and over 0.25 mg/dL ($p<0.0001$). The following 3 prognostic factors were found significant for recurrence by multivariate analysis included T classification (T1/T2-3), clinical presentation (incidental/symptomatic) and preoperative serum CRP (over 0.25/under 0.25). By multivariate analysis, T classification and an elevated CRP were the most important prognostic factors for overall survival in patients with localized RCC ($p = 0.0279$ and $p=0.0016$, respectively).

CONCLUSIONS: The preoperative CRP elevation in patients with localized RCC was an important predictor for prognosis. The appropriate threshold value of CRP for recurrence was 0.25 mg/dL.

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THE FOX CHASE R.E.N.A.L. NEPHROMETRY SCORE (R.E.N.A.L.-NS): A COMPREHESIVE STANDARDIZED SCORING SYSTEM FOR ASSESSING RENAL TUMOR SIZE, LOCATION, AND DEPTH

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INTRODUCTION AND OBJECTIVE: Partial nephrectomy (PN) is a preferred treatment for localized RCC. Unfortunately, treatment depends largely on qualitative data including the tumor's anatomy and the surgeon's experience with "difficult" PN. Characterization of a tumor's anatomy lacks standardization, making surgical and treatment comparisons difficult. We propose a standardized "nephrometry" score (R.E.N.A.L. - NS) to quantify the most salient anatomical features of renal masses on CT/MRI.

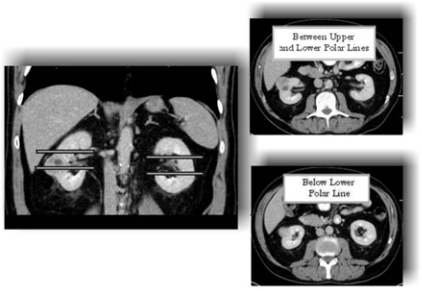
METHODS: The R.E.N.A.L. - NS is based on 5 critical and reproducible anatomical features of solid renal masses. 4 of 5 components are scored on a 1/2/3 point scale with the 5th indicating if the mass is primarily anterior or posterior to the kidney's axial midline. We used the R.E.N.A.L. - NS to evaluate 50 consecutive masses resected at Fox Chase.

RESULTS: The R.E.N.A.L.- Nephrometry Score consists of (R)adius (scores tumor size as its maximal diameter), (E)xophytic/endophytic properties at the deepest location, (N)earness of the tumor's deepest portion to the collecting system or sinus, (A)nterior (a)/posterior (p) to the axial midline of the kidney, and (L)ocation relative to the polar line (Figure/Table). Like Gleason score, nephrometry score ranges from 4 to 12 points with 4-6, 7-9, and 10-12 deemed "low", "moderate" and "high" complexity respectively for PN with an "a/p" descriptive suffix. Nephrometry scores were derived for 50 consecutive tumors undergoing open/lap radical or open/lap/robot partial nephrectomy (Table) CONCLUSIONS: Standardized reporting of renal tumor size, location, and depth is essential for decision making and effective comparisons. R.E.N.A.L. - NS is a reproducible standardized scoring system which quantitates the salient anatomy of renal masses. This novel approach for systematic characterization of renal tumors provides a tool for meaningful comparisons of renal masses in clinical practice and in the urological literature.

	1pt	2pts	3 pts
(R)adius (maximal diameter in mm)	≤4	>4 but < 7	≥ 7
(E)xophytic/endophytic properties at the deepest location	≥ 50%	<50%	Entirely endophitic
(N)earness of the tumor's deepest portion to the collecting system or sinus (mm)	≥ 5	>3 but <5	0-3
(A)nterior/Posterior	No points given. Mass assigned a descriptor of a or p		
(L)ocation relative to the polar line	Entirely above or below the polar line	Lesion crosses polar line	>50% of mass is across polar line or mass crosses the renal midline

	R.E.N.A.L. NEPHROMETRY SCORE				
	Score 4-6 (n)	Score 7-9 (n)	Score 10-12 (n)	Anterior (n)	Posterior (n)
Radical Nephrectomy					
Laparoscopic (n=14)	1	3	10	6	7
Open (n=5)	1	1	3	3	1
Partial Nephrectomy					
Robotic (n=17)	7	7	2	12	4
Open (n=14)	3	9	2	7	7

Description of the R.E.N.A.L. Nephrometry Score and score assignments for 50 consecutive masses resected at Fox Chase Cancer Center.



Scoring of the (L)ocation component of R.E.N.A.L.-NS is determined in relation to the upper or lower polar line (lines on sagittal image). We define the polar line as the portion of the kidney where the concentric rim of the renal parenchyma is interrupted by the renal hilar vessels, pelvis, or fat on axial imaging. The mass in the right kidney in both the sagittal and axial images is >50% above the polar line and thus receives a location score of 3 points. The depicted tumor receives an overall R.E.N.A.L-NS of 1+2+3+a+3 = 9a.

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PROGNOSTIC ROLE OF CHROMOSOME 9P DELETION IN PATIENTS WITH CLEAR CELL RENAL CELL CARCINOMA

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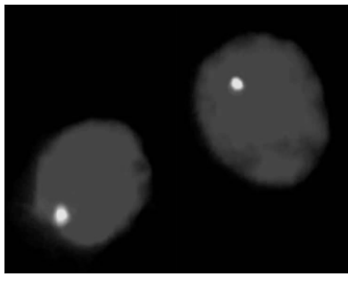
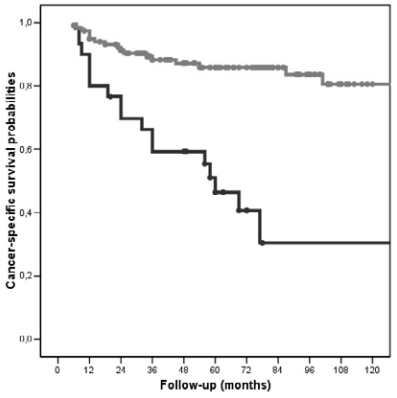
INTRODUCTION AND OBJECTIVE: Several prognostic models have been proposed for patients with clear cell renal cell carcinoma (ccRCC). Moreover, translational research is very active in RCC, with several molecular and genetic markers investigated to evaluate their prognostic role. The purpose of the study was to investigate the prognostic role of loss of chromosome 9p in a series of patients treated for ccRCC.

METHODS: We evaluated 188 patients with ccRCC treated by partial or radical nephrectomy. We built two tissue microarrays including at least three cores of neoplastic tissue and two cores for normal renal parenchyma from the fixed and embedded specimens. Interphase cytogenetic FISH analysis using a locus specific probe mapping on chromosome 9p was performed (figure 1).

RESULTS: 9p deletion was detected in 30 ccRCCs (20.1%). The median follow-up of the patients was 60 months. Loss of 9p was associated with significantly lower 5-year CSS probabilities (46% for those patients with vs. 86% for those without the deletion; $p<0.001$) (figure 2). Pathological T, N, and M stages, Fuhrman nuclear grades, presence of microscopic tumour necrosis, SSIGN score and UISS categories were significant on univariate analysis. In the first multivariate model, loss of 9p was an independent predictor of CSS (H.R.: 3.034; $p=0.0004$) regardless of pathological N stage, presence of metastases, and microscopic tumor necrosis. Similarly, in the other models, loss 9p was an independent predictor of CSS regardless of SSIGN score and UISS categories, respectively. In all the 3 multivariate models, the inclusion of 9p deletion significantly increased the prognostic accuracy of the baseline model (p-values <0.01).

CONCLUSIONS: 9p deletion was an independent predictor of CSS in patients with ccRCC. This cytogenetic abnormality increase the prognostic accuracy of both SSIGN score and UISS categories.





Source of Funding: None

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EX-VIVO PARTIAL NEPHRECTOMY AND RENAL AUTOTRANSPLANTATION FOR COMPLEX RENAL MALIGNANCIES IN THE SOLITARY KIDNEY

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INTRODUCTION AND OBJECTIVE: Open partial nephrectomy (OPN) is considered the gold standard treatment for patients with renal tumours in solitary functioning kidneys. In certain patients tumour size, number and location make in-vivo partial nephrectomy unfeasible, thereby necessitating alternative treatment strategies. We present our experience of managing complex renal tumours in solitary kidneys with ex-vivo partial nephrectomy and renal auto-transplantation (EPN).

METHODS: 19 patients presented to our department with renal tumours in single functioning kidneys. In 8 of these cases in-vivo partial nephrectomy was deemed unsuitable due to the complexity of the tumour. These patients were managed with radical nephrectomy, ex-vivo bench surgery and renal auto-transplantation. The operative, oncological and functional outcomes of these patients were compared with patients managed with conventional OPN.

RESULTS: Tumours in the EPN group were significantly larger than the OPN group (mean 6.0cm v 3.5cm, $p < 0.05$). EPN surgery was associated with longer total operative duration (mean 395 mins v 130 mins, $p < 0.001$), lower positive margin rates (12% v 30%) and equivalent peri-operative complication rates and length of hospital stay when compared to OPN. Despite the complex nature of EPN surgery, only 2 patients required temporary dialysis with nobody requiring long term dialysis. The volume of the residual renal remnant was similar in both groups as was long term preservation of renal function. The rates of local tumour recurrence, distant metastases and cancer specific survival were similar in the two groups.

CONCLUSIONS: The balance between oncological control and renal preservation when managing renal tumours in solitary functioning kidneys can be a considerable challenge. Patient preference and health care economics dictate that every effort should be made to prevent long term dependence upon renal dialysis. Large complex tumours deemed unsuitable for an OPN have often been managed with a radical nephrectomy and dialysis. In our experience EPN offers an excellent chance of renal preservation without compromising cancer control and should be considered a viable treatment option in this select group of patients.

Source of Funding: None

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CLEAR CELL HISTOLOGY REPRESENTS WORSE PROGNOSIS IN PATIENTS UNDERGOING SURGICAL TREATMENT FOR RENAL CELL CARCINOMA

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INTRODUCTION AND OBJECTIVE: Despite the clear demonstration that different histological subtypes of renal cell carcinoma (RCC) exhibit distinct pathogenesis and genetic alterations, the impact of histology on prognosis remains controversial. The purpose of this study was to define whether RCC histological type impacts the prognosis of patients undergoing surgical treatment.

METHODS: We identified 1,863 patients with clear cell, papillary, or chromophobe RCC who were treated surgically between 1989 and 2006 at our tertiary care center. Cox proportional hazards regression models were used to evaluate the relationship between tumor histology and outcome - defined as metastasis or death from disease. Age, sex, operation type, American Society of Anesthesiologists Physical Classificantion System (ASA) score, TNM stage, and tumor size were adjusted for in a multivariate analysis.

RESULTS: Overall 72% of patients (n=1333) had clear cell histology, 17% (n=310) had papillary RCC, and 12% (n=220) had chromophobe RCC. Patient characteristics are described in Table 1. The median follow-up for patients without an event was 3.4 years (interquartile range 1.3-6.5 years). Univariately, patients with clear cell histology had worse clinical outcomes: the 5-year probability of freedom from metastases or death from disease was 86%, 95% and 92% for patients with clear cell, papillary and chromophobe histology, respectively ($p < 0.001$; Figure 1). On multivariate analysis chromophobe and papillary histology remained significantly associated with better outcome: hazard ratio (HR) chromophobe = 0.40 (95% confidence interval (CI) 0.20-0.80); HR papillary = 0.62 (95% CI: 0.34-1.14); p=0.014.

CONCLUSIONS: Clear cell histology seems to be independently associated with a worse outcome in patients undergoing surgical treatment for RCC even after controlling for widely accepted factors influencing prognosis.

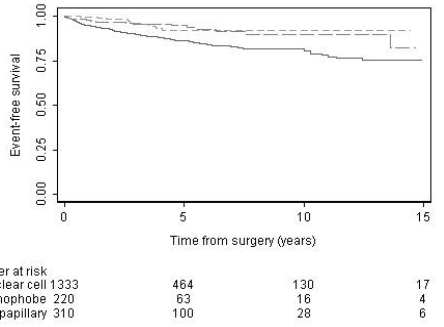

Table 1. Patient characteristics.

	Clear Cell n=1333	Chromophobe n=220	Papillary n=310
Age at surgery (years)	62 (53, 70)	59 (49, 67)	64 (56, 71)
Tumor diameter (cm)	4.1 (2.7, 6.8)	4.5 (3, 8.5)	3.5 (2.5, 5.3)
Male	836 (63%)	120 (55%)	236 (76%)
Radical nephrectomy (vs. partial)	871 (65%)	121 (55%)	141 (45%)
Lymph node involvement	23 (6%)	4 (5%)	7 (11%)
Year of Surgery			
Before 1995	228 (17%)	23 (10%)	52 (17%)
1995 - 2000	346 (26%)	47 (21%)	70 (23%)
2000 - 2006	759 (57%)	150 (68%)	188 (61%)
TNM Stage			
1	869 (65%)	133 (60%)	235 (76%)
2	94 (7%)	42 (19%)	29 (9%)
3	346 (26%)	43 (20%)	41 (13%)
4	24 (2%)	2 (1%)	5 (2%)